Aeromedical Evacuation

Lesson AM-46

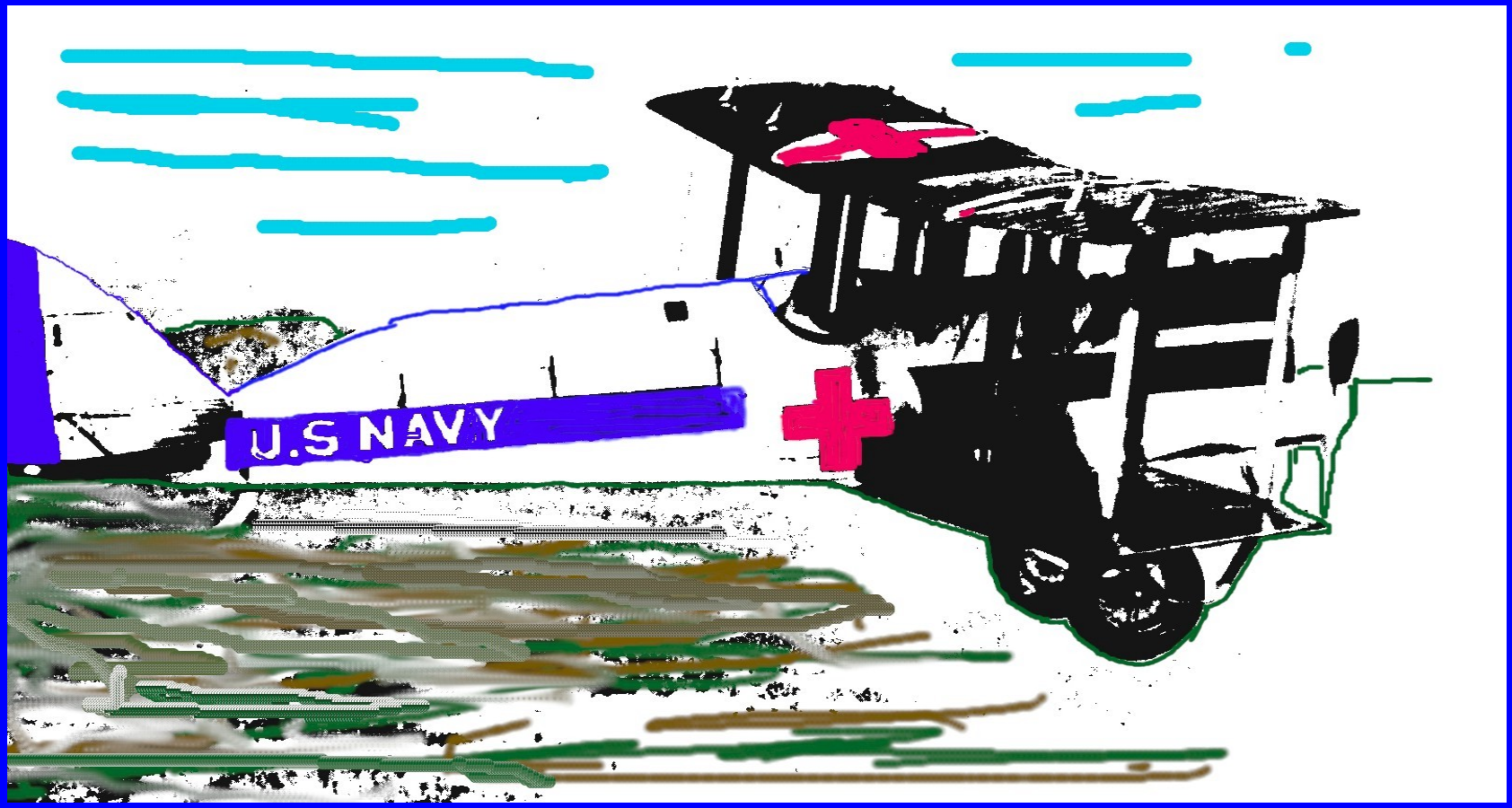
Objectives

- Historical Perspective
- Physiologic Factors
- Medical Conditions
- Evacuation Decisions
- Navy System
- Worldwide System
- Patient Preparation

First Air Transport of Patient in the US

- In 1918 a JN-3 “Jenny” aircraft was converted to carry a litter in the rear cockpit. The Navy JN-4 Air Ambulance carried a flight surgeon to the scene, then evacuated the patient in 1922.

US Navy Ambulance Airplane-1922



Marine Air Evacuation

- In 1927 in Nicaragua, Marine 1st Lt. Christian Schilt, a 32-yr old airplane racer from Olney, IL evacuated casualties by landing in the street of a village in his Vought O2U-1 Corsair biplane, taking off over the edge of a cliff. He carried 1,400 lbs of medicine and flew out 18 wounded in 10 daring flights, taking fire each time. President Coolidge awarded him the Medal of Honor for his action

World War II

- Marine Air Group 25 used 14 R4D2 aircraft during the Battle of Guadalcanal for air evacuation of wounded, September, 1942, 10 stretchers in each aircraft. Medical officers flew with seriously wounded, corpsmen with less seriously wounded and sick. Joined by Army transport planes in October, 1942. Evacuated 4,595 casualties in 4 months.
- In March, 1942 the South Pacific Combat Air Transport was formed, carried 12,017 patients from Guadalcanal from 9/42-6/43

Historical % of wounded who die

- WWI - 8.5%
- WW2 - 4% Korean War - 2%
- VietNam - 1 %
- Desert Storm - <1%

What is Medical Evacuation?

- The process of transporting sick, injured or wounded while providing essential medical care.

DOD Policy

- Airlift is the preferred method for medevac, peace time and wartime
  - If available
  - If environmental conditions permit
  - If patient condition does not contraindicate
- Specialized units used for Aeroevac
  - Other aircraft used if specialized units are not available

Medevac Decision Factors

- Patient condition exceeds your care capability
- The Medical Estimate
- Theater evacuation policy
- Risk/Benefit/Cost analysis
- Peacetime/Wartime Considerations
- No absolute contraindications

Medical Factors

- Infectious Patient Requiring Quarantine
  - Request the Vickers Unit, a portable, isolation module that is air transportable
  - Contact USAMRIID at Fort Detrick, MD
  - POC: DSN 343-7655
  - USAMRIID will coordinate with USAF AMC for global transport of the Vickers Unit

Medical Factors: Reduced Atmospheric Pressure

- Boyles law: volume of gas expands inversely to its partial pressure
- Air splints: avoid if feasible, otherwise, monitor splint pressure, limb circulation, reduce pressure periodically, minimize cabin altitude
- MAST trousers
- ET tube cuffs- use saline instead of air

Medical Factors: Reduced Atmospheric Pressure

- Expanding Biological Gases
  - Gut
    - Post g-i surgery
    - Ileus
    - Bowel obstruction
- Skull fracture
- Lacerated globe
- Decompression Illness

Medical Factors: Reduced Atmospheric Pressure

- Cardiovascular disease
- Pulmonary disease
- Severe Anemia
- Supplemental oxygen availability

Medical Factors: Dehydration

- Cabin air has low relative humidity
- Airway mucosal drying & development of mucus plugs in asthmatics
- Drying of cornea (Lacrilube)
- Humidification devices

Medical Factors: Motion Sickness

- Flight motion, injury, illness, meds, anxiety
- Anti-nausea drugs
- Oropharyngeal suction
- Complicated by restraints
- Complicated by jaw appliances

Medical Factors: Fatigue

- Flight Duration
- Immobility of cramped quarters
- Cabin altitude and temperature
- Circadian rhythm disruption
- Anxiety
- Noise
- Turbulence

Specific Disease & Injury Considerations

Cardiovascular

- Myocardial Infarction
  - Postpone for 8 weeks if practical
  - If Urgent, postpone until 10 days, 5 days with no symptoms
  - At cabin altitudes above 2,000 MSL use supplemental oxygen

Pulmonary Disease

- Oxygen partial pressure considerations
  - Pulse oximeter helpful
- Pneumothorax with chest tube
  - Heimlich valve
- Recently removed chest tube
  - CXR within 24 hrs prior to departure
  - Postpone flight for 72 hours

Anemia

- Hemoglobin of 8.5 or greater preferred
- Consider histotoxicity (such as CO)
- Sickle cell disease (maintain cabin altitude < 4,000 feet MSL)
- If Hgb < 8.5, administer supplemental oxygen at altitude

Gastro-Intestinal

- Increased risk with volvulus, hernia, ileus, and perforation of bowel
- Remember Boyle's law
- Recent gi surgery:
  - Postpone for 2 weeks for routine
  - Postpone for 5 days for urgent, or when peristalsis returns
  - consider NG tube, rectal tube
- Larger colostomy bag in flight

Orthopedics

- Splints preferred to casts
- Air Splints- air expansion a problem
- Casts: bivalve, check for limb circulation, edema
- Avoid hanging weights-flight hazard
- Stryker frames

Eye

- Consider air in lacerated globe
- Retinal injury compromises oxygen availability
- Consider oxygen supplementation

ENT

- URI: barotrauma to ears or sinuses
- Unconscious patient: barotrauma
- Facial and nasal fractures: consider CNS extension
- Post ear surgery: trapped middle ear gas

Skull Fracture

- Intracranial air expansion with increased ICP
- Respiratory depression
- Vomiting and aspiration
- Have skull X-rays after head trauma to rule out skull fracture
- Avoid axial acceleration (catapult)

Mandibular Fracture

- Fixation- non-permanent
  - Rubber bands
  - Emergency release instruments
  - Scissors, wire cutters attached to patient

Medevac Classification System

- Urgent
  - Life/limb/eyes at risk for loss
  - No terminal or psychiatric patients
  - MD to MD communication required
- Priority
  - Medevacs within 24 hours
  - MD to MD communication required
- Routine
  - Medevac within 72hours on regular, scheduled flight

Patient Classification System

- Class I Psychiatric Patients
  - 1A: severe, restraints, sedation, supervision
  - 1B: intermediate, sedated, restraints available
  - 1C: moderate, cooperative, ambulatory
- Class II Litter Patients
  - IIA Immobile
  - IIB Mobile, capable of self rescue

Patient Classification System

- Class III Walking, but may require treatment enroute
- Class IV Infants, but may require treatment enroute
- Class V Outpatients
- Class VI Attendants

Common Abbreviations:

- AE: Aeromedical Evacuation
- AECC: Aeromedical Evacuation Coordination Center
- AECM: Aeromedical Evacuation Crew Member
- ASF: Aeromedical Staging Facility
- DMRIS: Defense Medical Regulating Information System
- DNR: Do Not Resuscitate
- GPMRC: Global Patient Movement Requirements Center

Medevac Considerations

- Mission First
- Patient considerations/ inflight evaluations
- Receiving Facilities & Capabilities
- Transportation Availability & Distances
- Meterological Factors
- Patient and Crew Safety
- Diplomatic and Legal Considerations

Navy System

- Not Dedicated Crews
  - Transportation from Naval asset to USAF AE facility
  - 30 Day Cost orders for patient and any attendants (attendant must have identical itinerary
  - Helo: convenient, short-range
  - COD (C-2): catapult shot, intermediate range

  Steaming Time

SH-60 Helicopter

SH-3B Helicopter

CH-46D Helicopter

CH-53E Helicopters

Ship to Shore Transfer

- CO Must approve, XO must be informed
- CO/OX are the Final Authority
- Unit Mission is paramount

C-2A Greyhound used for Medevac from Carrier

MV-22 Osprey Tilt-Rotor

Out of CONUS: Information on MTF Availability

- AFMIC - Medcaps on worldwide medical threats : DSN 343-7574
- Check airfield availability with OPS
- Check military hospitals with Admin
- Consular & Embassy Staffs for medical assets ashore
- Personal In-Port Visits
- Prior Medevac & After Action Reports

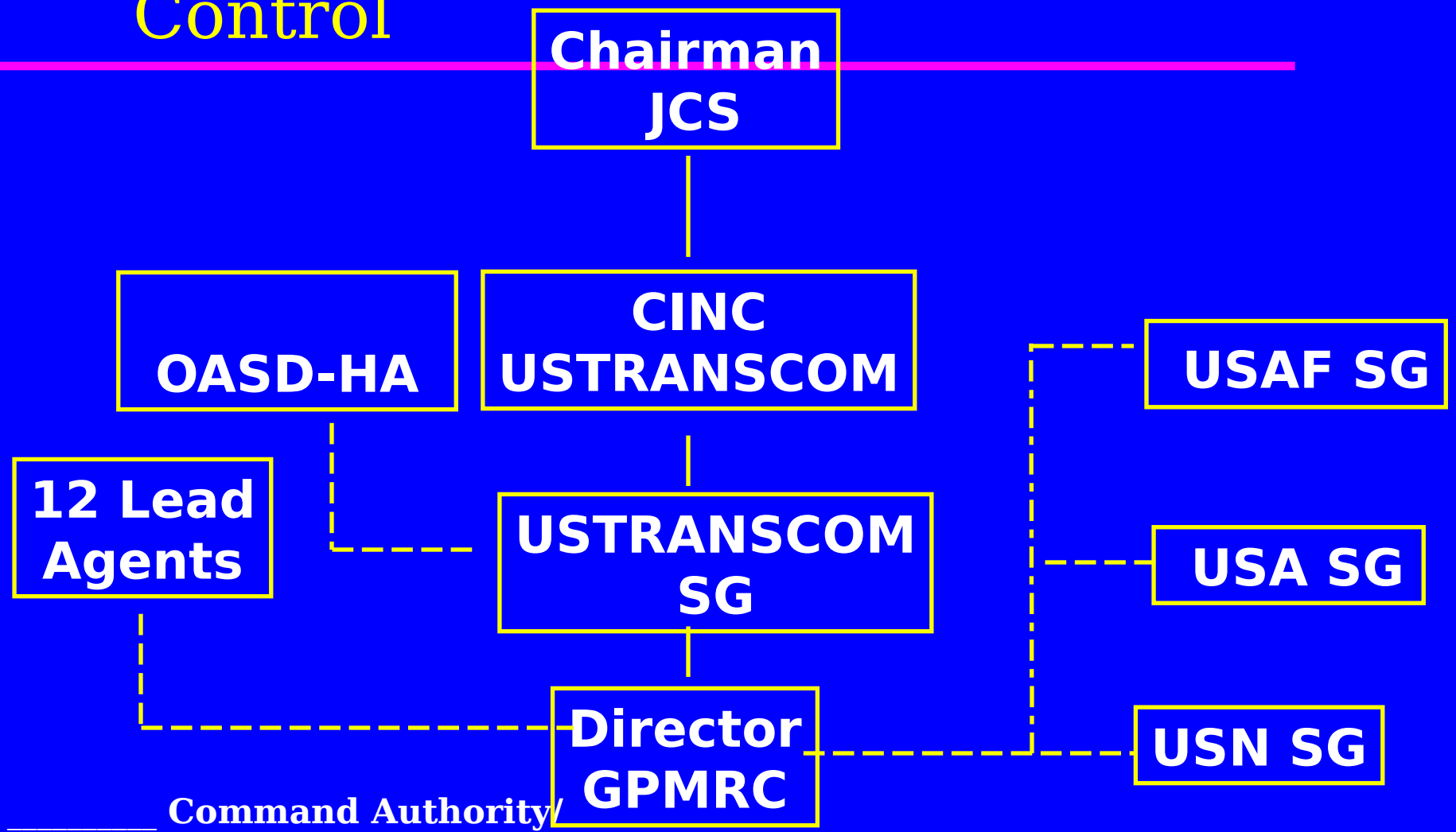
Out of CONUS: Information on MTF Availability

- Transferring MD responsible-don't evac and forget
- Attendant
- Money- Orders 30 Days Cost-Documents
- Communication and follow-up
- Acceptance by Receiving MTF prior to transfer
- Brief XO/CO-keep them informed

In CONUS

- Beware Convenience Medevacs
- Weather, Geographic factors
- Medevac Flight Crew: they take more risks than for other missions- beware
- May be asked to consult on ill-advised air medevac- be frank and diplomatic
- Educate non-FS MD and Admin

GPMRC Command and Control



Right time, Right mode, Righ

PEACETIME FUNCTIONS

- 24 hour one-stop shop for customer
  - Maintain familiar ASMRO/AECC functionality
- Patient services
  - Regulate all patients
  - Validate patients
- Identify movement requirements

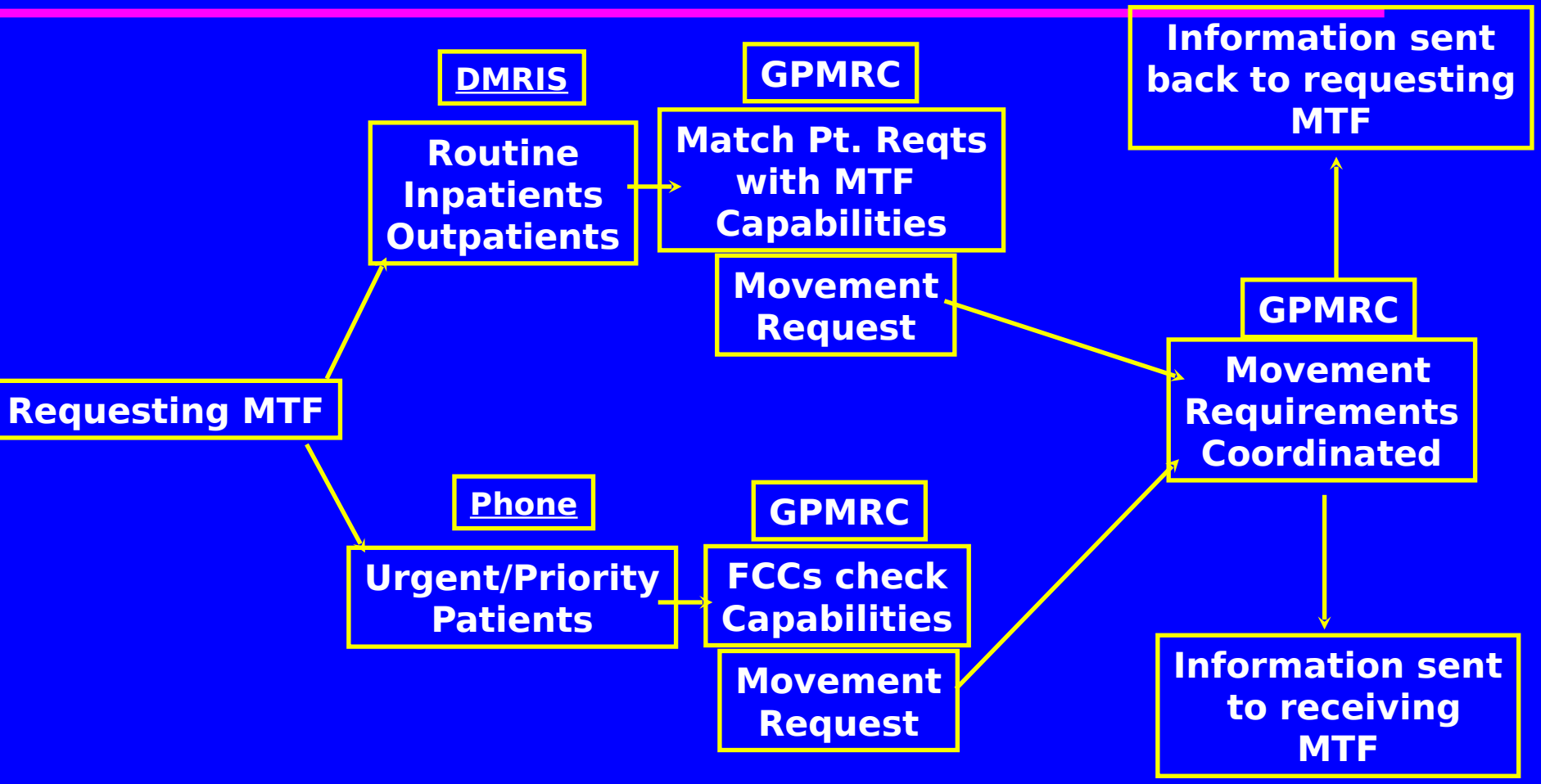
COORDINATION CENTRAL

- GPMRC has no inherent movement capability
  - "request" all assets
    - » C-9 from 375th Air Wing
    - » C-141 from Tanker Airlift Control Center
    - » C-21/C-12s - various organizations
    - » Helicopters from USA

Global Medevac System

- USAF/AMC Staging Bases
  - Domestic: Scott AFB (Medevac Center)
  - Travis, Kelly, Maxwell, Andrews
- Pacific
  - Yokota (Japan)
- Atlantic
  - Rhein-Main (Germany)
- MASF staging facilities enroute for minimal care, feeding, processing

SYSTEM OVERVIEW
Reporting Patients for AE

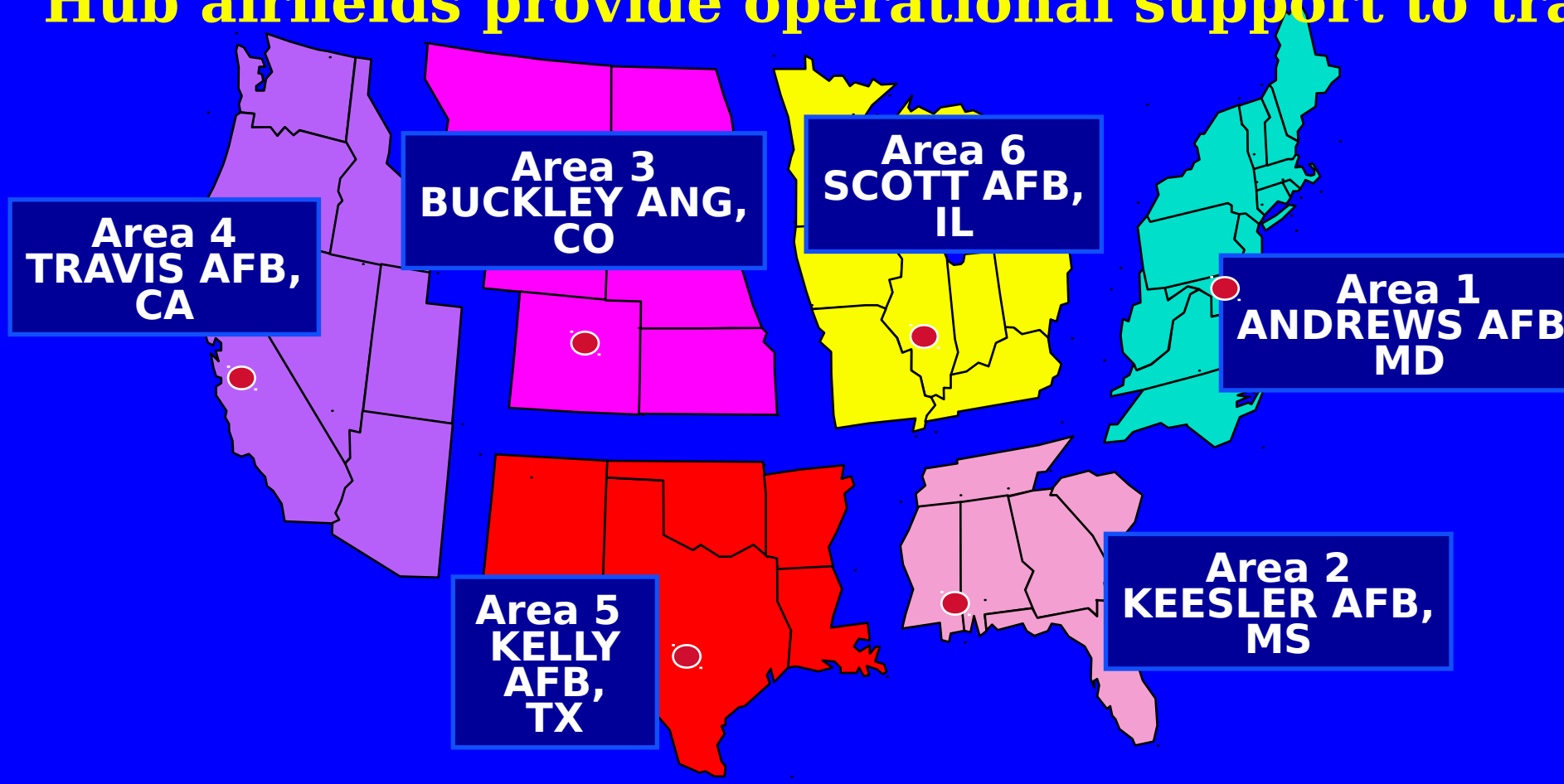


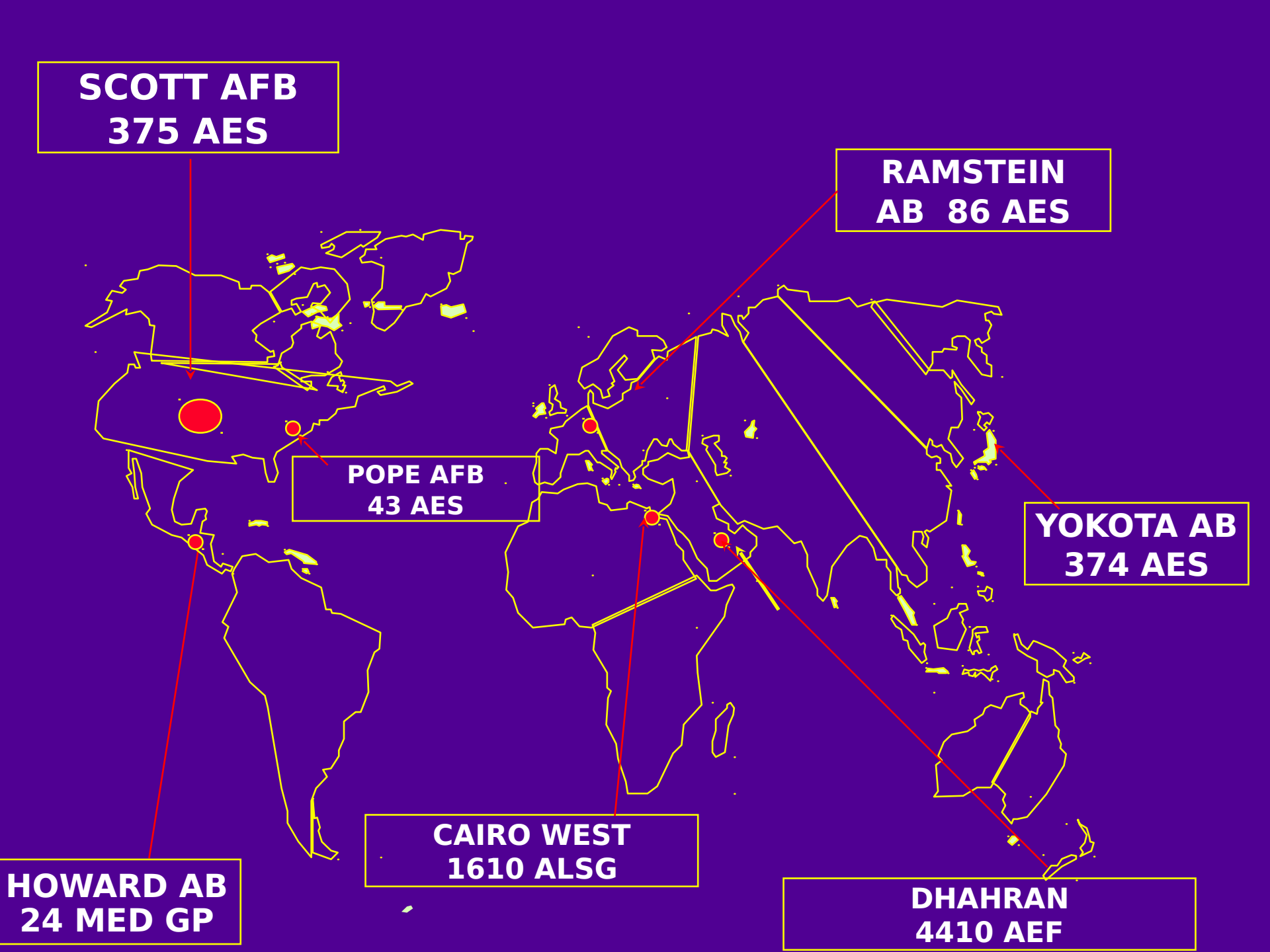
Initiating a Medevac-IN CONUS

- Global Patient Movement Requirement Center (GPMRC)
  - Air Evac Clerk (at MTF) or MSC (CV/CVN) arranges
- Scott AFB GPMRC OPS:
  - DSN 576-6241 / 4939

CONUS AREAS AND HUB AIRFIELDS

Hub airfields provide operational support to tra




SCOTT AFB
375 AES
RAMSTEIN
AB 86 AES
POPE AFB
43 AES
YOKOTA AB
374 AES
CAIRO WEST
1610 ALSG
HOWARD AB
24 MED GP
DHAHRAN
4410 AEF

Initiating a Medevac-OCONUS

- Joint Medical Regulating Officer (JMRO)
  - Joint Service Operated for OCONUS Medevacs
  - Rhein-Main/Camp Smith, Germany for Europe--DSN 330-7427 / 7428
  - Yokota, Japan for Pacific Medevacs

    DSN 225-4700

Medevac Assistance

- For Information on medical aspects or medical regulation of Medevacs:

  DSN 576-6261

- Navy Liaison: DSN 576-4938 / 4939

How it Works

- Decision to Medevac
- Contact GPMRC or JMRO
- GPMRC or JMRO finds available MTF with level of care required
- Patient movement-you may not know destination, but Urgent requires MD to MD communication

375th Aeromedical Evacuation Wing

- 4th Aeromed Evacuation Squadrons (AES)
  - 375th Scott
  - 1st- Pope AFB, North Carolina
  - 374th - Yokota, Japan
  - 86th - Rein-Main, Germany

Aircraft

- C-130 ? 74 litters, 94 ambulatory
- C-9A ? 30-40 litters, 40 ambulatory
- C-141 ? 103 litters, 168 ambulatory
- Crew:
  - 2 RN
  - 3 Techs
  - No Docs
- CCAATs

USAF C-141B Used for OCONUS Medevac

Patient Preparation

- DD Form 602 (Patient Evac Tag)
  - Primary & Secondary diagnosis
  - Medical Orders for enroute
  - Treatments
- Medical Narrative Summary
- Records & X-rays
- Medications for 3 days (5 days OCONUS)

Patient Preparation

- Special Diets
- Medical Supplies, Blankets, PJs, Bandages
- Money/Orders/Admin Documents & Records

Patient Preparation

- Remember, it is the responsibility of the originating Medical Officer to Provide Care until arrival at the accepting MTF--you do this by the sufficiency of your transfer orders!

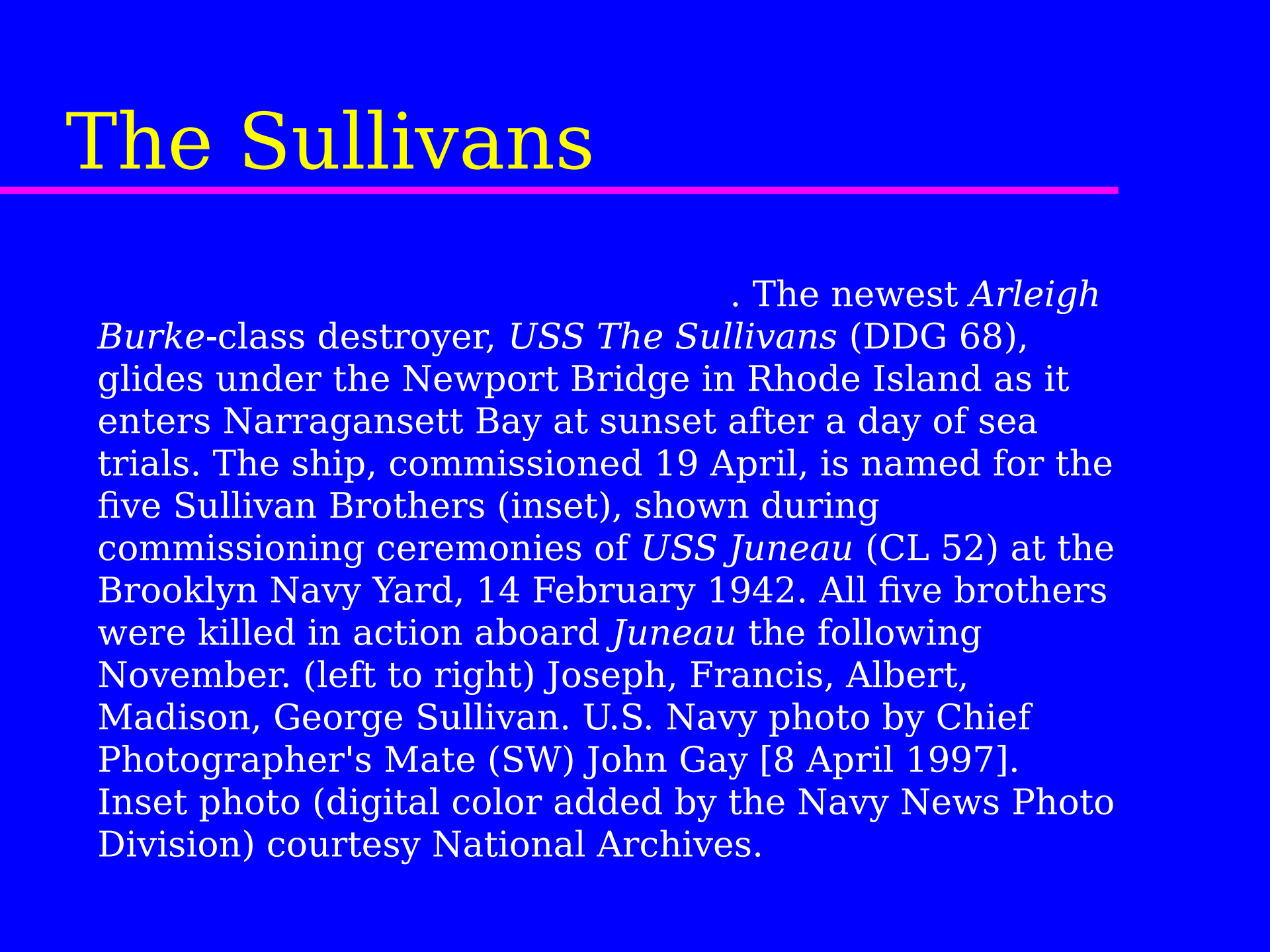
Follow Up

- Very Difficult
- Medical Attendant
- Lost in a World Wide System
- Patient may be delayed by a higher priority patient at any point in the route
- Navy liaison helpful
- Keep CO/XO informed

Medical Factors: Critical Care Staffing

- Staff one MD or one ICU RN with ACLS training for each ICU level patient

The Sullivans



. The newest *Arleigh Burke*-class destroyer, *USS The Sullivans* (DDG 68), glides under the Newport Bridge in Rhode Island as it enters Narragansett Bay at sunset after a day of sea trials. The ship, commissioned 19 April, is named for the five Sullivan Brothers (inset), shown during commissioning ceremonies of *USS Juneau* (CL 52) at the Brooklyn Navy Yard, 14 February 1942. All five brothers were killed in action aboard *Juneau* the following November. (left to right) Joseph, Francis, Albert, Madison, George Sullivan. U.S. Navy photo by Chief Photographer's Mate (SW) John Gay [8 April 1997]. Inset photo (digital color added by the Navy News Photo Division) courtesy National Archives.

The 5 Sullivan Brothers